

REMARKS

Claims 7 and 16 have been rejected under 35 U.S.C. §103(a) as unpatentable over Morikawa (U.S. Patent No. 6,138,638) in view of Hochstrasser et al (U.S. Patent No. 6,990,954). In addition, Claims 8-15 and 16-25 have been rejected as unpatentable over the same two references, and further in view of Oosuga et al (U.S. Patent No. 4,596,220). However, for the reasons set forth hereinafter, Applicants respectfully submit that all claims of record in this application are allowable over the cited references.

The Morikawa reference discloses a system for diagnosing and controlling a high-pressure fuel system for an in-cylinder fuel injection engine. In particular, Morikawa is directed to diagnosing the presence of an abnormality in such a high-pressure fuel system, and to a control system for addressing such an abnormality. The Office Action indicates in this regard that Morikawa discloses a system in which a quantity of fuel is metered in as a function of the operating point during a working cycle, referring in particular to Figure 16. Applicants note in this regard, however, that Figure 16, and the discussion thereof at Column 5, lines 43-64, appear to be directed to the timing of the fuel injection, rather than to a calculation of the amount. In particular, it is noted that, when the fuel system is suffering an abnormality, if the fuel injection timing is set in the compression stroke such as to coincide with the stratified combustion, as

shown in Figure 16, in order to feed low pressure fuel of the low-pressure fuel system to the injectors 13, it becomes impossible to insure the correct differential pressure between the pressure of the low pressure fuel injected from the injector 13, and the cylinder pressure, and that it is not possible, therefore, to measure accurately the fuel injection quantity. Under these circumstances, however, the specification indicates, in particular at Column 35, lines 55-60, it is possible to measure the fuel injection quantity accurately based on the injection-valve opening period of the injector 13, and the fuel injection pulse width T_i .

Nevertheless, Applicants acknowledge that Morikawa discloses a fuel injection system of the type described in the description of the prior art at Column 1, lines 42-48 of the present application, in which "a fuel injection pulse width defining the fuel injection quantity is set on the basis of the engine operating condition...." However, as the Office Action also acknowledges, Morikawa fails to teach or suggest the feature of the present invention, as recited in independent Claims 7 and 16, in which the quantity of fuel which is metered and injected into the combustion chamber is performed in such a manner that the combustion center of gravity is at a defined crank angle position, independently of the operating point of the internal combustion engine. In particular, Morikawa does not disclose a method for operating a compression ignition internal combustion engine which includes a step of adjusting engine

parameters in such a manner that the position of the combustion center of gravity for a quantity of fuel which is injected into the engine is maintained at a defined crank angle position, independently of the operating point of the internal combustion engine. Moreover, it also does not teach or suggest a method such as defined in Claim 16 which includes the steps of determining the current position of the combustion center of gravity, comparing it with a preset desired position, and adjusting the operating parameters of the engine so that the combustion center of gravity is positioned at a defined crank angle position, independently of the operating point of the internal combustion engine.

The latter features of the invention are said to be disclosed in Hochstrasser et al. However, to the extent that this ground of rejection relies on Hochstrasser et al, it is respectfully traversed, because Hochstrasser et al does not constitute prior art with respect to the present invention. That is, since the International Application (PCT/DE02/02685) was not in English, the effective date of Hochstrasser et al as a reference is its PCT Publication Date of April 24, 2003. The latter date is after the priority date of the present application, which is April 9, 2003. Accordingly, Applicants have submitted herewith a certified translation of the priority document, thereby effecting the claim of priority for this application.


The Oosuga et al patent has been cited only in respect of dependent Claims 8-15 and 16-25. Claims 8-15 and 17-25, however, are dependent claims, which are allowable by virtue of their dependence on allowable Claims 7 and 16. Accordingly, Applicants respectfully submit that all claims of record in this application are now allowable.

Finally, Applicants note that they have amended Claim 7 in order to place it in a better format for prosecution in the United States, without, however, significantly altering its scope. In addition, Claims 8 and 16 have been amended to define a feedback operation, in which the current position of the combustion center of gravity is determined and compared with a predetermined crank angle position, with the engine parameters being altered until a current position of the combustion center of gravity corresponds to the predefined crank angle position. The latter features of the invention are also neither taught nor suggested by the prior art.

In light of the foregoing remarks, this application should be in consideration for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #095309.56877US).

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gary R. Edwards", written over a horizontal line.

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